

# Audit



# Report

OFFICE OF THE INSPECTOR GENERAL

**FUNCTIONAL AND PHYSICAL CONFIGURATION  
AUDITS OF DEFENSE SYSTEMS**

Report No. 97-037

December 2, 1996

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**Department of Defense**

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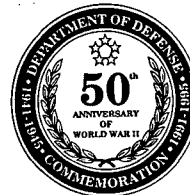
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### **Acronyms**

NAVSTAR GPS	Navigation System Time and Ranging Global Positioning System
NTCS-A	Navy Tactical Command System-Afloat
REACT	Rapid Execution and Combat Targeting



**INSPECTOR GENERAL**  
**DEPARTMENT OF DEFENSE**  
**400 ARMY NAVY DRIVE**  
**ARLINGTON, VIRGINIA 22202-2884**



Report No. 97-037

December 2, 1996

**MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION  
AND TECHNOLOGY  
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL  
MANAGEMENT AND COMPTROLLER)  
ASSISTANT SECRETARY OF THE AIR FORCE  
(FINANCIAL MANAGEMENT AND COMPTROLLER)  
DIRECTOR, DEFENSE LOGISTICS AGENCY  
AUDITOR GENERAL, DEPARTMENT OF THE ARMY**

**SUBJECT: Audit of Functional and Physical Configuration Audits of Defense Systems  
(Project No. 5AE-0032.05)**

## **Introduction**

We are providing this audit report for your information and use. This report summarizes our overall evaluation of the adequacy of the functional and physical configuration audit process for the acquisition of Defense systems. This report is the sixth and final in a series of reports resulting from our audit of functional and physical configuration audits of Defense systems. A functional configuration audit is a formal examination of functional characteristics of test data for configuration items to verify that the items have achieved their specified performance. A physical configuration audit is a formal examination to verify that the configuration items "as built" conform to the technical documentation that defines the items. Enclosure 2 provides definitions of technical terms used in this report.

## **Audit Results**

The Military Departments' policies and procedures for managing the functional and physical configuration audit process were adequate. We identified no systemic deficiencies in the effectiveness of the functional and physical configuration audit process for the five Defense systems (the Army Kiowa Warrior and Paladin systems, the Navy Tactical Command System-Afloat [NTCS-A], and the Air Force Navigation System Time and Ranging Global Positioning System [NAVSTAR GPS] and Rapid Execution and Combat Targeting [REACT] system) in our review. However, we did identify areas where the program offices for the five systems could individually improve their management of the functional and physical configuration audit process. The results of our review of the five systems, including applicable findings, recommendations, and management comments, are synopsized in Enclosure 3.

## **Audit Objective**

The audit objective was to evaluate the adequacy of the functional and physical configuration audit process for the acquisition of Defense systems. Specifically,

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we determined whether functional and physical configuration audits verified and documented that configuration items agreed with their configuration identifications, were complete and accurate, and satisfied program requirements. We also evaluated the management control program as it related to our audit objective. In Enclosure 1, we discuss the scope and methodology used to accomplish the objective as well as management controls and prior audit coverage.

## **Audit Background**

When we began our audit, DoD Instruction 5000.2, part 9, section A, "Configuration Management," contained the functional and physical configuration guidance for the five Defense systems in our review. The instruction required program managers to establish an effective configuration management program to implement the decisions made in the systems engineering process by identifying, documenting, and verifying the functional and physical characteristics of a configuration item; controlling changes to an item and its documentation; recording the configuration of actual items; auditing the configuration item and its configuration identification; and providing a configuration status accounting to track changes in configuration items. During the audit, the Deputy Secretary of Defense issued DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPS) and Major Automated Information System (MAIS) Acquisition Programs," March 15, 1996. The regulation establishes requirements for configuration management. Subpart 4.3, "Systems Engineering," requires that the program manager use a systems engineering process that includes configuration management to control the system products, processes, and related documentation. Further, DoD Regulation 5000.2-R mandates that, as part of systems engineering, the program manager should establish a configuration management process to identify, document, and verify the functional and physical characteristics of an item; record the configuration of an item; control changes to an item and its documentation; and provide a complete audit trail of decisions and design modifications. As a result of the new guidance, we tailored our review to conform with the guidance in DoD Regulation 5000.2-R.

## **Discussion**

Overall, the Military Departments' policies and procedures were adequate for managing the functional and physical configuration audit process and tailoring their configuration management processes to comply with DoD Regulation 5000.2-R. We based our audit of management of the functional and physical configuration audit process on the evaluation of five Defense systems: the Kiowa Warrior, the Paladin, the NTCS-A, the NAVSTAR GPS, and the REACT systems. In performing the system audits, we did identify and report on system-specific deficiencies in the areas of verifying closure of action items, updating and completing interface control documents, managing waivers and deviations, updating configuration management procedures, and performing type certifications. The following table summarizes the system-specific areas that required improvement for the five systems reviewed.

## Summary of Audit Findings for the Five Defense Systems Reviewed

<u>Systems Reviewed by Military Component</u>	<u>Areas That Required Improvement</u>				
	<u>Verifying Closure of Action Items</u>	<u>Updating and Completing Interface Control Documents</u>	<u>Managing Waivers and Deviations</u>	<u>Updating Configuration Management Procedures</u>	<u>Performing Type Certifications</u>
Army					
Kiowa Warrior	x				x
Paladin	x				
Navy					
NTCS-A				x	
Air Force					
NAVSTAR GPS		x	x		
REACT		x	x		

Each program office took appropriate corrective action in response to the system-specific deficiencies. In addition, we suggested that the NTCS-A Program Office submit its configuration management plan to the Deputy Under Secretary of Defense (Acquisition Reform) to be included in the Defense Acquisition Deskbook as an example of an effective way to tailor the configuration management process for a software intensive system that uses an evolutionary acquisition strategy.

**Verifying Closure of Action Items.** The Kiowa Warrior and Paladin Program Offices needed to improve internal procedures for verifying closure of configuration-audit action items.

**Kiowa Warrior System.** The Kiowa Warrior Program Office had not:

- o tracked all open action items from the critical design review of the modifications to the OH-58D Kiowa helicopter to validate that changes were made to the system during the functional and physical configuration audits and

- o tracked and closed out all action items from each functional and physical configuration audit before it certified the audits as complete.

As a result, the Kiowa Warrior Program Office had not ensured that functional and physical configuration audit deficiencies were corrected before release of the design for Kiowa Warrior helicopter production.

**Paladin System.** The Paladin Program Office adequately performed the physical configuration audit and verified the closure of action items. However, for the functional configuration audits, the Program Office had not completed management actions needed to verify the closure of data-source-matrix line

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items and to determine whether unverified items still needed to undergo a functional configuration audit. The Program Office considered the system-specification requirements to be configuration items and defined those configuration items as data-source-matrix line items for verification and tracking purposes.

**Updating and Completing Interface Control Documents.** The NAVSTAR GPS Joint Program Office and the REACT Program Office needed to place greater emphasis on maintaining current and complete interface control documents.

**NAVSTAR GPS System.** The contractor for mission-processor software used incomplete interface control documents to perform formal qualification tests on Block IIR satellite components. The NAVSTAR GPS Joint Program Office used the test results to certify the successful completion of functional configuration audits of Block IIR satellite components. As a result, the Joint Program Office had to establish an operational baseline and obligate an additional \$15.6 million to modify satellite software, conduct additional system tests, and establish an interface control agreement.

**REACT System.** The REACT Program Office used out-of-date interface control documents to perform REACT formal qualification tests. The Program Office used the test results to certify the successful completion of the REACT functional configuration audits. For example, the Program Office did not verify that the interface control documents for the REACT Program were current and updated for the formal qualification tests of the REACT voice control panels and the auxiliary alarm panel. Consequently, when the contractor conducted the formal qualification test, the test results were based on interface control documents that did not accurately show the current operational configuration of the system. As a result, the Program Office had to obligate an additional \$1.1 million to redesign and retrofit REACT console hardware configuration items and had to conduct another functional configuration audit for those items.

**Managing Waivers and Deviations.** The NAVSTAR GPS Joint Program Office and the REACT Program Office needed to improve procedures for reviewing, identifying, documenting, and obtaining consideration for contractor-requested waivers and deviations.

**NAVSTAR GPS System.** For 11 of the 24 waivers, deviations, and engineering changes reviewed, the NAVSTAR GPS Joint Program Office did not document the cost reductions or other consideration that were appropriate and did not obtain such consideration from the contractor for 6 of the 11 actions. As a result, the procuring contracting officer did not have a basis for determining whether the contractors were proposing adequate consideration for the waivers, deviations, and engineering changes. Further, the Joint Program Office had no assurance that it obtained adequate consideration from the contractors for granting the waivers, deviations, and engineering changes.

**REACT System.** The REACT Program Office did not adequately document its technical reviews and did not perform cost and price analyses to

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assess the adequacy of cost reductions and other consideration offered by the contractor for waivers of contract specifications. As a result, the Program Office had no assurance that contractors compensated the Government adequately for eight approved waivers, totaling \$439,000, and would compensate the Government adequately for future waivers and deviations.

**Updating Configuration Management Procedures.** The NTCS-A Program Office adequately managed the functional and physical configuration audit process. However, the NTCS-A Program Office had not updated its procedures for identifying, documenting, and verifying the functional and physical characteristics of configuration items to conform with current practices. Specifically, the NTCS-A Configuration Management Plan that contained the procedures did not show the tailored configuration control process used for the NTCS-A Program, which is a software intensive system that uses an evolutionary acquisition strategy.

**Performing Type Certifications.** The Kiowa Warrior Program Office accepted the Federal Aviation Administration's performance of type certification for the Kiowa Warrior's turboshaft engine in place of Allison Engine Company's performance of the contractually required functional and physical configuration audits. However, that Federal Aviation Administration certification was not a totally adequate replacement for the configuration audits because the Federal Aviation Administration certification process did not ensure independent DoD oversight to verify proper functioning and design of the engine against Kiowa Warrior Program-unique requirements. As a result, without independent DoD oversight, the Kiowa Warrior Program cannot be assured that the engine has a stable product baseline and that product baseline documentation adequately describes all Kiowa Warrior unique functional and physical characteristics; acceptance testing criteria; and tests necessary for deployment and installation, logistics support, training, and disposal of the engine. Further, the contractor may have received windfall compensation by not being required to perform the configuration audits.

## **Conclusion**

Overall, the Military Departments and the program offices for the five Defense systems included in our review were adequately managing the functional and physical configuration audit process. We commend the five program offices for their responsiveness to system-specific recommendations made to improve the functional and physical configuration audit process. The adequacy of the process used to identify, document, and verify functional and physical characteristics of a system is critical to ensuring that a system operates properly and can be supported efficiently and effectively. By not implementing adequate processes, the systems that we reviewed spent over \$16 million to correct problems that could have been avoided; potentially paid contractors for work not done in accordance with contractual requirements by not determining and obtaining adequate consideration; and put the systems at risk of future problems and changes by not ensuring stable product baselines.

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## Management Comments

We provided a draft of this report to you on October 30, 1996. Because the report contains no findings or recommendations, written comments were not required, and none were received. Therefore, we are publishing this report in final form.

We appreciate the courtesies extended to the audit staff. If you have questions on this report, please contact Mr. John E. Meling, Audit Program Director, at (703) 604-9091 (DSN 664-9091) or Mr. Jack D. Snider, Audit Project Manager, at (703) 604-9087 (DSN 664-9087). Enclosure 4 lists the distribution of this report. The audit team members are listed inside the back cover.



David K. Steensma  
Deputy Assistant Inspector General  
for Auditing

Enclosures



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## Scope and Methodology

This enclosure discusses the scope and methodology used to accomplish the objective as well as organizations and individuals visited or contacted, management controls, and prior audit coverage.

### Scope

We conducted this audit from January 1995 through October 1996 and reviewed data dated from October 1981 through June 1996 relating to the five Defense systems reviewed: the Army Kiowa Warrior and Paladin, the Navy NTCS-A, and the Air Force NAVSTAR GPS and REACT. To accomplish the objective, we judgmentally selected the systems for review. As a result of our review, we issued a separate report for each system and synopsized those reports in Enclosure 3. We used the results of those reports to summarize our evaluation of the adequacy of the functional and physical configuration audit process for the acquisition of Defense systems.

### Methodology

We conducted this program audit in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We included such tests of management controls as we deemed necessary. We did not rely on computer-processed data to develop conclusions on this audit. Technical experts from the Quantitative Methods and Technical Assessment Divisions of the Analysis, Planning, and Technical Support Directorate, Inspector General, DoD, and consultants from the Acquisition Management Directorate, Inspector General, DoD, assisted in the audit.

### Organizations and Individuals Visited or Contacted

We visited or contacted individuals and organizations within the DoD and the Department of Transportation; Serv-Air, Blue Grass Depot Activity; Aerospace Corporation; Allison Engine Company; Bell Helicopter Textron, Incorporated; Honeywell Incorporated; International Telephone and Telegraph; Lockheed Martin; McDonnell Douglas Corporation; TRW; and United Defense, Limited Partnership. Further details are available on request.

### Management Control Program

**Requirement for Management Control Review.** DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987,\* requires DoD

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\* DoD Directive 5010.38 has been revised as "Management Control (MC) Program," August 26, 1996. The audit was performed under the April 1987 version of the directive.

## Scope and Methodology

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organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the management controls.

**Scope of Review of Management Control Program.** We limited our review because of relevant coverage in Inspector General, DoD, Report No. 96-028, "Implementation of the DoD Management Control Program for Major Defense Acquisition Programs," November 28, 1995. The report discusses the effectiveness of the management control program that the Defense Acquisition Executive and the Component Acquisition Executives used for major Defense acquisition programs. The report concludes that the acquisition community had not effectively integrated DoD Management Control Program requirements into its management assessment and reporting processes. As a result of the report recommendations, the Under Secretary of Defense for Acquisition and Technology integrated DoD Directive 5010.38 requirements into the March 15, 1996, revisions to DoD Directive 5000.1, "Defense Acquisition," and DoD Regulation 5000.2-R. Acquisition managers are now to use program cost, schedule, and performance parameters as control objectives to implement the DoD Directive 5010.38 requirements. The managers are to identify material weaknesses through deviations from approved acquisition program baselines and exit criteria in the "Defense Acquisition Executive Summary" report. Accordingly, we limited our review to management controls over the functional and physical configuration audit process at the Kiowa Warrior, Paladin, NTCS-A, NAVSTAR GPS, and REACT Program Offices.

**Adequacy of Management Controls.** Management controls were adequate in that we did not identify any systemic management control weakness applicable to the audit objective for the Kiowa Warrior, Paladin, NTCS-A, NAVSTAR GPS, and REACT systems.

## Prior Audit Coverage

During the last 5 years, the General Accounting Office and the Military Department audit agencies have not issued reports addressing the functional and physical configuration audit process or the application of the process in the five systems included in this audit. Synopses of the Office of the Inspector General, DoD, reports on the five systems reviewed are at enclosure 3.

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## Definitions of Technical Terms

**Action Item.** A document that, because of a functional or physical configuration audit, requires correction of a deficiency in the functional characteristics or technical documentation associated with a configuration item.

**Configuration Control Board.** A Government or contractor board composed of technical and administrative representatives who recommend approval or disapproval of proposed engineering changes to a configuration item's current approved configuration documentation. The board also recommends approval or disapproval of proposed waivers and deviations from a configuration item's current approved configuration documentation.

**Configuration Identification.** The process of establishing and describing the contractual baselines and related configuration items.

**Configuration Item.** An aggregation of hardware, firmware, or computer software or any of their discrete portions that satisfies an end use function and is designated by the Government for separate configuration management.

**Configuration Management.** Technical and administrative direction and surveillance actions taken to identify and document functional and physical characteristics of an item, to control changes to a item and its characteristics, and to record and report change processing and implementation status.

**Configuration Management Plan.** A document defining how configuration management will be implemented, including policies and procedures, for a particular acquisition or program.

**Critical Design Review.** A review conducted to:

- o determine that the detailed design satisfies performance and engineering requirements of the development specification;
- o establish the detailed design compatibility requirements of the development specification;
- o establish the detailed design compatibility among the item and other items of equipment, facilities, computer program, and personnel;
- o assess producibility and risk areas; and
- o review the preliminary product specifications.

**Data-Source-Matrix Line Item.** Configuration item derived from the Paladin Program's system specification requirements.

## Definitions of Technical Terms

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**Deviation.** A written authorization, granted before the manufacture of an item, to depart from a particular performance or design requirement of a specification, drawing, or other document for a specific number of units or a specified period.

**Engineering Change Proposal.** A contractor document that describes and justifies a proposed engineering change and applicable costs and that a contractor submits to the Government for approval or disapproval.

**Evolutionary Acquisition.** An acquisition strategy used to procure a system that evolves during development to achieve an overall system capability. An underlying factor in evolutionary acquisition is the need to field a well-defined core capability quickly in response to a validated requirement, while planning through an incremental upgrade program to eventually enhance the system to provide the overall system capability.

**Firmware.** The combination of a hardware device and computer instructions or computer data that reside as read-only software on the hardware device.

**Formal Qualification Test.** A system level test to verify that the configuration item meets the performance requirements of the system specification.

**Functional Configuration Audit.** A formal examination of functional characteristics of test data for configuration items to verify that the items have achieved the performance specified in their functional or allocated identification. If the items were developed at Government expense, the functional configuration audit must be performed before acceptance of the items. The functional configuration audit must be performed on a prototype or the configuration to be released for production of the operational quantities.

**Interface Control Document.** A technical agreement required to successfully develop interoperable configuration items designed independently by technical engineers.

**Low-Rate Initial Production.** The production of a system in limited quantity to provide articles for operational test and evaluation and to establish an initial production rate sufficient to lead to full-rate production upon successful completion of operational testing.

**Mission-Processor Software.** Software that allows the NAVSTAR GPS satellite to process and transmit navigational data to and from the master ground control station.

**Operational Baseline.** The product baseline as updated with subsequent software modifications to make the product baseline satisfy operational requirements for current and future satellite operations.

**Physical Configuration Audit.** A formal examination to verify that the configuration item "as built" conforms to the technical documentation that defines the item. The physical configuration audit includes a detailed audit of engineering drawings, specifications, technical data, and tests used in

## Definitions of Technical Terms

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production of the item. The physical configuration audit may be conducted on the first full-rate production or the first low-rate initial production item. Government program office approval of the product specification and satisfactory completion of the physical configuration audit establish the product baseline. A contractor is required to process all future changes to the product baseline by the formal engineering change proposal process.

**Product Baseline.** The baseline established at the physical configuration audit that includes product, process, and material specifications and engineering drawings. Approval of the configuration item product specification by the Government program office and satisfactory completion of the physical configuration audit establish the product baseline.

**Prototype.** An original or model on which a later item is formed or based.

**Rework.** Any corrections of defective work either before, during, or after inspection.

**Specification.** A document intended primarily for use in procurement that clearly and accurately describes the essential technical requirements for items, materials, or services, including the procedures for determining whether the requirements have been met.

**Waiver.** A written authorization to accept a configuration item that departs from specified requirements. The item may be considered suitable "as is" or after rework by an approved method.

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## **Synopses of System Audit Reports of the Functional and Physical Configuration Audit Process**

From January through October 1996, the Inspector General, DoD, issued five audit reports involving Defense systems with issues related to the functional and physical configuration audit process.

**Audit Report No. 97-011, "Functional and Physical Configuration Audits of the Air Force Navigation System Time and Ranging Global Positioning System," October 28, 1996.** The report states that, overall, the functional and physical configuration audit processes for the NAVSTAR GPS were well managed; however, two areas needed improvement.

- o The contractor for mission-processor software used incomplete interface control documents to perform formal qualification tests on Block IIR satellite components. The NAVSTAR GPS Joint Program Office used those test results to certify the successful completion of functional configuration audits of Block IIR satellite components. As a result, the Joint Program Office had to establish an operational baseline and obligate an additional \$15.6 million to modify satellite software, conduct additional system tests, and establish an interface control agreement.

- o For 11 of the 24 waivers, deviations, and engineering changes reviewed, the Joint Program Office did not document the cost reductions or other consideration that were appropriate and did not obtain such consideration from the contractor for 6 of the 11 actions. As a result, the Joint Program Office had no assurance that it received adequate consideration for waivers and deviations approved for the miniaturized airborne NAVSTAR GPS receivers; for engineering changes approved for the Block IIR satellite; and for future waivers, deviations, and engineering changes.

We recommended that the NAVSTAR GPS System Program Director require approval and certification of complete interface control documents before future critical design reviews and formal qualification tests, designate the interface control process as a high risk management control function in the management control program, and require NAVSTAR GPS project officers and the Joint System Configuration Control Board to document their recommendations for equitable contract price adjustments or other consideration for pending and future waivers, deviations, and engineering changes. We also recommended that the Director of Contracting, NAVSTAR GPS, modify applicable contracts for approved pending and future waivers, deviations, and engineering changes to obtain an equitable price adjustment or other consideration after considering recommendations from the NAVSTAR GPS Joint Program Office.

In response to the report, the System Program Director concurred with the recommendations concerning approval and certification of complete interface control documents, designation of the interface control process as a high risk management control function, and documentation of project officer and Joint System Configuration Control Board recommendations. In response to the

## Synopses of System Audit Reports of the Functional and Physical Configuration Audit Process

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recommendation concerning the modification of applicable contracts for waivers, deviations, and engineering changes, the Deputy Director of Contracting, NAVSTAR GPS, concurred with the recommendation and provided actions taken and planned.

**Audit Report No. 96-211, "Functional and Physical Configuration Audits of the Navy Tactical Command System-Afloat," August 14, 1996.** The report states that the NTCS-A Program Office adequately managed the functional and physical configuration audit process. However, the NTCS-A Program Office had not updated its procedures for identifying, documenting, and verifying the functional and physical characteristics of configuration items to conform with current practices. During our audit, the NTCS-A Program Office began updating its configuration management plan to incorporate current functional and physical configuration management procedures. The report did not contain any recommendations because the Program Office took corrective action during the audit.

**Audit Report No. 96-130, "Functional and Physical Configuration Audits of the Army Paladin Program," May 24, 1996.** The report states that the Paladin Program Office adequately performed its physical configuration audit and verified the closure of action items. However, for the functional configuration audits, the Program Office had not completed management actions needed to verify the closure of data-source-matrix line items and to determine whether unverified items still needed to undergo a functional configuration audit. During our audit, the Program Office took appropriate corrective actions to verify and close the items and to conduct functional configuration audits of unverified items. The report did not contain any recommendations because the Program Office took corrective actions during the audit.

**Audit Report No. 96-073, "Functional and Physical Configuration Audits of the Air Force Rapid Execution and Combat Targeting Program," February 16, 1996.** The report states that the functional and physical configuration audit processes for the REACT Program needed improvement.

- o The REACT Program Office used out-of-date interface control documents to perform REACT formal qualification tests. The Program Office used the test results to certify the successful completion of the REACT functional configuration audits. As a result, the Program Office had to obligate an additional \$1.1 million to redesign and retrofit affected REACT console hardware items and had to conduct another functional configuration audit for those items.

- o The REACT Program Office did not adequately document its technical reviews and did not perform cost and price analyses to assess the adequacy of cost reductions and other consideration offered by the contractor for waivers of contract specifications. As a result, the Program Office had no assurance that contractors compensated the Government adequately for eight waivers, totaling \$439,000, and would compensate the Government adequately for future waivers and deviations.

## Synopses of System Audit Reports of the Functional and Physical Configuration Audit Process

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We recommended that the REACT Program Manager assign a higher priority to maintaining current interface control documents and obtain equitable price adjustments or other consideration in return for approving waivers of specifications based on documented cost and price analyses. In response to the report, the Program Executive Officer, Bombers, Missiles and Trainers, concurred with the recommendations and took appropriate action to implement the recommendations.

**Audit Report No. 96-063, "Functional and Physical Configuration Audits of the Army Kiowa Warrior Program," January 31, 1996.** The report states that the functional and physical configuration audit process for the Kiowa Warrior Program needed improvement.

- o The Kiowa Warrior Program Office did not adequately manage the functional and physical configuration audit process for the Kiowa Warrior Program. As a result, the Program Office may incur additional costs from reverse engineering, redesign, and retrofit during production.

- o The Kiowa Warrior Program Office accepted the Federal Aviation Administration's performance of type certification for the Kiowa Warrior's turboshaft engine in place of Allison Engine Company's performance of the contractually required functional and physical configuration audits. As a result, the Kiowa Warrior Program cannot be assured that the engine has a stable product baseline and that product baseline documentation adequately describes all Kiowa Warrior unique functional and physical characteristics, acceptance testing criteria, and post-production testing. Further, the contractor may have received windfall compensation by not being required to perform the configuration audits.

We recommended that the Kiowa Warrior Program Office complete the Kiowa Warrior helicopter product baseline, verify closure status of configuration audit action items, obtain complete drawings and technical data packages, designate a DoD representative to supplement the Federal Aviation Administration engine inspection and certification process, and correct engine problems before awarding future engine production contracts.

In response to the report, the Action Officer, Office of the Assistant Secretary of the Army (Research, Development and Acquisition), did not concur with all of our recommendations; however, he proposed alternative actions that met the intent of our recommendations. The following represents the responses to our recommendations.

- o Concerning the completion of the Kiowa Warrior helicopter product baseline, the Action Officer stated that completing the product baseline would not be practical; however, he stated that the Kiowa Warrior Program Office is conducting functional and physical configuration audits for new system modifications that will ensure that the configuration audit process is in place, is functioning, and meets the needs of good program management.



## Synopses of System Audit Reports of the Functional and Physical Configuration Audit Process

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o Concerning the verification of the closure status of configuration audit action items, the Action Officer stated that the Kiowa Warrior Program Office implemented a tracking and closure process for open action items resulting from functional and physical configuration audits.

o Concerning the obtaining of complete drawings and technical data packages, the Action Officer stated that the Kiowa Warrior Program Manager should specifically evaluate the need to acquire complete drawings and technical data packages for possible future second sourcing or competitive bids.

o Concerning the designation of a DoD representative to supplement the Federal Aviation Administration engine inspection and certification process, the Action Officer stated that current procedures adequately cover certification requirements, including those of the Federal Aviation Administration and military. However, he stated that the Army engine airworthiness review for the 250-C30R/3 engine would consider Federal Aviation Administration and military qualification data.

o Concerning the correction of engine problems before awarding future engine production contracts, the Action Officer stated that the production approval for the 250-C30R/3 engine would not be given until the Army airworthiness review had been completed.

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## **Audit Team Members**

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report.

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